

In the Claims:

1. (Original) A method for segmenting and forwarding packets, comprising:

receiving a packet, wherein the packet includes a destination that determines forwarding parameters;

as the packet is being received, creating segmentation cells from portions of the packet received, wherein each segmentation cell is provided to a switching fabric as the segmentation cell is completed;

when an end portion of the packet is received, verifying that the packet was received successfully;

when the packet has been received successfully, generating a verification data set based on segmentation cells utilized to forward the packet, wherein the verification data set is included in a final segmentation cell that is provided to the switching fabric; and

when the packet has not been received successfully, generating a purging data set that is included in the final segmentation cell that is provided to the switching fabric.

2. (Original) The method of claim 1, wherein the packet is received in a first encapsulation format, wherein at least a portion of the first encapsulation format is removed from the packet prior to creation of the segmentation cells.

3. (Original) The method of claim 2, wherein a second encapsulation format is added to the packet as the segmentation cells are created, wherein the second encapsulation format adapts the packet for transmission through the switching fabric.

4. (Original) The method of claim 1, wherein creating segmentation cells further comprises:

when a sufficient portion of the packet has been received to create a segmentation cell, creating the segmentation cell and providing the segmentation cell to the switching fabric;

storing any residual portion of the packet not included in the segmentation cell in a buffer;

combining the residual portion of the packet with subsequently received packet portions to create a subsequent segmentation cell, wherein any new residual portion of the packet resulting from creation of the subsequent segmentation cell is stored in the buffer.

5. (Original) The method of claim 4, wherein, for a first segmentation cell, determining that a sufficient portion of the packet has been received for the first segmentation cell further comprises determining that enough of the packet has been received to determine a route for segmentation cells of the packet through the switching fabric and determining that enough of the packet has been received to fill available payload space within the first segmentation cell.

6. (Original) The method of claim 4, wherein storing any residual portion of the packet further comprises:

determining a buffer location for the packet from a context table;

storing the residual portion of the packet in the buffer based on the buffer location and a current buffer count; and

updating the current buffer count to reflect storage of the residual portion in the buffer.

7. (Original) The method of claim 6, wherein creating forwarding cells further comprises referencing the context table to determine current forwarding status of the packet.

8. (Original) The method of claim 1, wherein verifying that the packet was received successfully further comprises verifying at least one of: a received length parameter associated with the packet, and a received cyclical redundancy check parameter associated with the packet.

9. (Original) The method of claim 8, wherein generating the verification data set further comprises generating at least one of:

a verification length parameter, wherein the verification length parameter is maintained to reflect length of the packet as provided to the switching fabric as the segmentation cells are created and provided to the switching fabric such that when the final segmentation cell is created, a final value of the verification length parameter is known; and

a verification cyclical redundancy check, wherein a running cyclical redundancy check value is maintained as segmentation cells are created such that when the final segmentation cell is created a final value of the running cyclical redundancy check indicates the verification cyclical redundancy check for the packet as provided to the switching fabric.

10. (Original) The method of claim 8, wherein generating the verification data set further comprises at least one of:

modifying the received length parameter based to produce a verification length parameter that reflects length of the packet as provided to the switching fabric; and

modifying the received cyclical redundancy check parameter to produce a verification cyclical redundancy check that is valid for the packet as provided for the switching fabric.

11. (Original) The method of claim 1, wherein receiving the packet further comprises receiving the packet as a plurality of ATM cells.

12. (Original) The method of claim 11, wherein receiving the packet as a plurality of ATM cells further comprises receiving the packet as a plurality of ATM cells over a plurality of virtual connections.

13. (Original) The method of claim 1, wherein receiving the packet further comprises receiving the packet in a packet over SONET format.

14. (Original) The method of claim 1, wherein receiving the packet further comprises receiving the packet in a Frame Relay format.

15. (Original) The method of claim 1, wherein creating segmentation cells further comprises creating fixed-length segmentation cells, wherein the switching fabric is a backplane of a fixed-transfer-length switch, wherein the backplane interouples a plurality of fixed-transfer-length line cards, wherein the fixed-length segmentation cells facilitate forwarding packets amongst the plurality of fixed-transfer-length line cards.

16. (Original) The method of claim 1, wherein creating segmentation cells further comprises creating ATM segmentation cells, wherein the switching fabric is a backplane of an ATM switch, wherein the backplane interouples a plurality of ATM line cards, wherein the ATM segmentation cells facilitate forwarding packets amongst the plurality of ATM line cards.

17. (Canceled)

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28. (Canceled)

29. (Original) A segmentation processor for forwarding a packet that is received, wherein the packet includes a destination that determines forwarding parameters, comprising:

a processing module; and

memory operably coupled to the processing module, wherein the memory stores operating instructions that, when executed by the processing module, cause the processing module to perform the functions of:

as the packet is being received, creating segmentation cells from portions of the packet received, wherein each segmentation cell is provided to a switching fabric as the segmentation cell is completed;

when an end portion of the packet is received, verifying that the packet was received successfully;

when the packet has been received successfully, generating a verification data set based on segmentation cells utilized to forward the packet, wherein the verification data set is included in a final segmentation cell that is provided to the switching fabric; and

when the packet has not been received successfully, generating a purging data set that is included in the final segmentation cell that is provided to the switching fabric.

30. (Original) The segmentation processor of claim 29, wherein the packet is received in a first encapsulation format, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to remove at least a portion of the first encapsulation format from the packet prior to creation of the segmentation cells.

31. (Original) The segmentation processor of claim 30, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to add a second encapsulation format to the packet as the segmentation cells are created, wherein the second encapsulation format adapts the packet for transmission through the switching fabric.

32. (Original) The segmentation processor of claim 29, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of creating segmentation cells such that creating segmentation cells further comprises:

when a sufficient portion of the packet has been received to create a segmentation cell, creating the segmentation cell and providing the segmentation cell to the switching fabric;

storing any residual portion of the packet not included in the segmentation cell in a buffer;

combining the residual portion of the packet with subsequently received packet portions to create a subsequent segmentation cell, wherein any new residual portion of the packet resulting from creation of the subsequent segmentation cell is stored in the buffer.

33. (Original) The segmentation processor of claim 32, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of creating segmentation cells such that, for a first segmentation cell, determining that a sufficient portion of the packet has been received for the first segmentation cell further comprises determining that enough of the packet has been received to determine a route for segmentation cells of the packet through the switching fabric and determining that enough of the packet has been received to fill available payload space within the first segmentation cell.

34. (Original) The segmentation processor of claim 29, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of storing any residual portion of the packet such that storing any residual portion of the packet further comprises:

determining a buffer location for the packet from a context table;

storing the residual portion of the packet in the buffer based on the buffer location and a current buffer count; and

updating the current buffer count to reflect storage of the residual portion in the buffer.

35. (Original) The segmentation processor of claim 34, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of creating forwarding cells such that creating forwarding cells further comprises referencing the context table to determine current forwarding status of the packet.

36. (Original) The segmentation processor of claim 29, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of verifying that the packet was received successfully such that verifying further comprises verifying at least one of: a received length parameter associated with the packet, and a received cyclical redundancy check parameter associated with the packet.

37. (Original) The segmentation processor of claim 36, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of generating the verification data set such that generating the verification data set further comprises generating at least one of:

a verification length parameter, wherein the verification length parameter is maintained to reflect length of the packet as provided to the switching fabric as the segmentation cells are created and provided to the switching fabric such that when the final segmentation cell is created, a final value of the verification length parameter is known; and

a verification cyclical redundancy check, wherein a running cyclical redundancy check value is maintained as segmentation cells are created such that when the final segmentation cell is created a final value of the running cyclical redundancy check indicates the verification cyclical redundancy check for the packet as provided to the switching fabric.

38. (Original) The segmentation processor of claim 36, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of generating the verification data set such that generating the verification data set further comprises at least one of:

modifying the received length parameter based to produce a verification length parameter that reflects length of the packet as provided to the switching fabric; and

modifying the received cyclical redundancy check parameter to produce a verification cyclical redundancy check that is valid for the packet as provided for the switching fabric.

39. (Original) The segmentation processor of claim 29, wherein the packet is received as a plurality of ATM cells.

40. (Original) The segmentation processor of claim 39, wherein the packet is received as a plurality of ATM cells over a plurality of virtual connections.

41. (Original) The segmentation processor of claim 29, wherein the packet is received in a packet over SONET format.

42. (Original) The segmentation processor of claim 29, wherein the packet is received in a Frame Relay format.

43. (Original) The segmentation processor of claim 29, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of creating segmentation cells such that creating segmentation cells further comprises creating fixed-length segmentation cells, wherein the switching fabric is a backplane of a fixed-transfer-length switch, wherein the backplane interouples a plurality of fixed-transfer-length line cards, wherein the fixed-length segmentation cells facilitate forwarding packets amongst the plurality of fixed-transfer-length line cards.

44. (Original) The segmentation processor of claim 29, wherein the memory includes operating instructions that, when executed by the processing module, cause the processing module to perform the function of creating segmentation cells such that creating segmentation cells further comprises creating ATM segmentation cells, wherein the switching fabric is a backplane of an ATM switch, wherein the backplane interouples a plurality of ATM line cards, wherein the ATM segmentation cells facilitate forwarding packets amongst the plurality of ATM line cards.